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Governance of Eco-Efficiency in Japan

An Institutional Approach

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Abstract

The article analyses Japanese approaches to dealing with eco-efficiency from an institutional perspective. Our main outlook is that though promising attempts have been made despite the overall economic crisis, a better horizontal coordination among both administrations and businesses is required. The governance processes can be analysed following approaches developed by New Institutional Economics and related policy analysis. The paper is divided into three sections. The first introduces the concept of eco-efficiency and explains the demand for regulatory policies from theories of market failures; the paper argues in favour of innovation-oriented regulation. The second examines how a nation's institutional capabilities influence knowledge generation towards new solutions that sell on the markets; the "capacity-building approach" as developed by Martin Jänicke is explicitly discussed. The third section discusses contemporary Japanese policies with regard to waste, energy and material flows both on the governmental and the business level. It explains how European approaches diffuse and merge with domestic Japanese institutions. However, governance of eco-efficiency is expected to continue to differ due to ongoing national differences and specific conditions of knowledge creation.

1. Introduction

It has often been said that environmental and economic goals can largely be harmonised via intelligent concepts and new technologies. Beyond myths and rhetoric, however, just a few concepts remain that seem to indicate a path towards sustainable development. Eco-efficiency can be regarded as one of these concepts because it is attractive to businesses and offers various environmental benefits. If the concept offers solutions to ongoing problems, policy analysis ought to address to what extent well-known market deficits, such as external costs and information deficits, hinder businesses from following that direction. Eco-efficiency can hardly be expected to become a self-runner, even if it offers cost-savings and tools for innovation. A demand for policies that foster eco-efficiency seems evident.

With regard to policies for eco-efficiency, institutional capabilities arise on the research agenda. Building upon the work of North (1990, 1998) the argument laid down in this paper is that the institutional capabilities of each nation differ through its influence on the costs of processing information into know-how both in the arena of policy and business. Institutions shape the direction of technical progress as well as the speed by which a society adapts to new framework conditions. Along this vein, eco-efficiency policies must meet with these institutional capabilities. Ideally, low-cost policy options emerge that create markets and enhance cooperation. The argument will be illustrated with reference to Japanese policies of eco-efficiency. Japan can be regarded an interesting example for three reasons:

- Its environmental policies began relatively early and now follow a shift from cleaning-up towards integrated and precautionary measures (Imura 1997, Weidner 1996),
- Japanese institutions were able to produce huge economic success until the mid-nineties and are now in a period of redesign (Boltho/Corbett 2000, Lazonick 1999, Matsuba 2001), and
- Japanese institutions can be expected to draw upon other countries' experiences and to transform these into useful policies.

Given these introductory remarks, the paper is divided into three sections. The first introduces the concept of eco-efficiency and explains the demand for policies. The second examines how a nation's institutional capabilities influence knowledge generation towards new solutions that sell on the markets. The third section discusses contemporary Japanese policies with regard to waste and material flows. Our main thesis is that though promising attempts have been made despite the overall economic crisis, a better horizontal coordination among both administrations and businesses is required.

2. Eco-Efficiency: Concept and Policies

Eco-efficiency is to be understood as doing good business while improving the overall environmental performance of a firm or a product. The concept was introduced by the Business Council on Sustainable Development on the occasion of the Earth Summit in Rio in 1992 (Schmidheiny 1992) and has been spread by its successor organisation WBCSD (2001), OECD (1998), European Commission (2001), World Bank (2001), United Nations (1999), and various other organisations. The concept of eco-efficiency assists companies in their quest for continuous improvement in minimising their use of resources. It encourages creative strategies of preventative management by integrating environmental considerations throughout the whole life cycle and promotes an active shift from a particular product to multi-use products and services. In doing so, it involves employees and creates tangible economic benefits.

The concept reflects a change in environmental management. Increasingly, the environment is being regarded as an opportunity for innovation, and not as a threat to a company. This shift is related to a parallel change in environmental policies from cleaning-up activities towards integrated and precautionary measures. Whereas cleaning-up and pollution control measures necessarily add additional costs to companies, the new approach allows for cost reduction and innovation. Measures aiming at recycling of waste, saving energy and other natural resources reduce existing costs within companies. In addition, new markets emerge that are triggered by both regulation *and* companies' self-interest. Companies actively enhancing eco-efficiency are able to improve their product design, procurement, manufacturing processes, product maintenance, and their customer relationships.

Measures of eco-efficiency integrate life-cycle-wide material flows, i.e. resource exploitation, its transformation into various substances and products, and solid waste. A rationale for integrating material flows into environmental management and policy basically follows three directions of argument:

- Environmental impact of materials matters either directly from landscape alterations or land use change, or indirectly from solid waste or emissions resulting from both the extraction and use of materials,
- Scarcity of natural resources is a case in point, in particular for non-renewable resources,
- Only if material flows and energy inputs are measured, can resource productivity gains be expected.

A methodology for measuring material flows as one ingredient of eco-efficiency has been developed and tested for some industrialised countries (Bringezu 2001, Matthews et al. 2000) as well as on the company level (Kuhndt/Liedtke 1999). Clearly, such a measurement methodology still deserves further research. It also has to be underlined that the methodology offered has its limitations as to what extent it covers overall environmental pressure (Hukkinen 2001, Moffatt et al. 2001). Nevertheless, material flows and the ensuing approach of "dematerialisation" evidently become an element, perhaps even a cornerstone, in strategies of companies and economies.

The concept of eco-efficiency and its underlying philosophy of dematerialisation open up new ways to look at the full system costs and the value associated with products or services. In most companies, inefficiencies in the form of incompletely utilised materials, undiscovered energy saving potentials, etc., are obvious. Process control for natural resources often is relatively poor. These system costs have traditionally been overlooked by environmental management, which instead focussed on pollution control. As a result of the new approach, companies can minimise or even save factor-related costs at a profit (Kuhndt/ Liedtke 1999, Porter/v. d. Linde 2000: 37).

In addition to such a shift of internal attention, managers rethink the issue of quality. Eco-efficiency underpins a view of increasing the overall quality of production processes, products, and services. Companies now unleash the power of innovation and quality management to eliminate what was previously accepted as necessary by-products. Process-related innovations occur along the chain, e.g. substitution or reuse of production inputs, increases in process yields, careful monitoring and maintenance, and improvements in the product as a by-product of change. Product related benefits result from safer and durable products, high quality, new materials within products, and higher product resale. Additionally, elements of reuse, recyclability and durability are integrated, leading to better materials and a new product design.

New and additional types of eco-efficient services appear: producers, broker agencies and specialised companies have to deal with reusing materials, product elements and with operating heating and cooling systems generated by nearby sources. Financial services for high-quality goods offer opportunities for those reluctant to invest in high-priced goods (with lower running costs). Financial markets also pre-select supply options and may force producers to increase the lifetime of their goods. A third type of new service is related to information and communication. Companies and consumers have strong preferences for better information about eco-efficient innovations helping them to lower their costs. Any leasing and sharing of goods used only for a limited time is assisted by communication systems offered by SMEs or larger companies.

After all, eco-efficiency stimulates the cooperation within industry as well as between industry, services and the public sector. For economies, it means a new direction of technical progress. The new direction would increase the market shares for products, which meet the criteria of low or zero emissions, low waste, zero toxic dispersion, etc. Authors such as Weizsaecker, Lovins and Lovins (1997), Lovins and Hawken (2000), and Schmidt-Bleek[1] propose that economies will be able to increase their resource productivity by a factor of four or even ten via the dynamics of eco-efficient economies.

If profitable innovations follow from such a business concept, if improving resource productivity can offset compliance, production and transaction costs, the question arises whether regulation is necessary at all. Wouldn't companies explore these fascinating opportunities and follow the path of new markets? That is like the notion of no big bills being left on the sidewalk because someone else will have already picked them up. Indeed, some pioneering companies pursue eco-efficiency without or in advance of any regulation. It can be expected that mechanisms of diffusion and imitation driven by competition work. But a general assumption that companies will pick up opportunities when they are faced with uncertainties, information deficits and unclear perspectives about trends would be too optimistic. In addition, eco-efficiency cannot ignore both negative and positive external costs associated with production patterns. Policies, therefore, have to address specific market failures in order to harness eco-efficiency.

A need for regulation favouring eco-efficiency arises for the following reasons (WI 2002; Porter/v.d. Linde 2000: 44):

- To create attention that motivates companies to innovate,
- To overcome market failures such as external costs, the provision of public goods, information and adaptation deficits,
- To generate knowledge about likely resource inefficiencies and potential areas for improvements,
- To create and stabilise demand for environmental improvements,
- To level the playing field during transition periods between technological trajectories,
- To raise the likelihood of a new direction of technological progress,
- To keep political functions of stricter measures in cases where the environment continues to deteriorate or new negative external costs occur.

Governance of eco-efficiency should primarily support business, and not restrict it. The efforts for innovation-friendly regulation have not only relaxed following the success of former pollution control policies. They too can draw upon mechanisms of self-regulation driven by competition and entrepreneurial spirit

[1] Ernst Ulrich von Weizsäcker and Friedrich Schmidt-Bleek, the founders of the Factor X concept, were awarded the Japanese Takeda World Environment Award in 2001.

that are able to overcome some temporary market failures. Governments do not have to regulate minor deficits, but they will have to keep an eye on the speed and the direction of change, supported by increasing scientific evidence on environmental change and computer-based scenario analysis. Specific forms of regulation will have to be developed which foster the dissemination of innovations and the development of new products and services. Market introduction, technology transfer, institutional design as well as science and education policies will have to play their role. Criteria for choosing between different options may include i) efficiency of instruments for different industries (e.g. SMEs) and the economy as a whole, ii) the effectiveness regarding environmental targets, and iii) the adaptation flexibility, which is useful to consider for unforeseeable events (WI 2002).

Economic incentives are one eligible candidate for regulatory tools that allow companies and markets to emerge without those constraints that have been associated with command and control instruments. In addition, a critical employment situation suggests not drawing the largest share of fiscal revenues from labour while resource use remains essentially free of charge. Along this line of argument, almost all EU membership states have adopted some kind of eco-taxes since the late nineties (EEA 2001). The predominant aim is a moderate but steady increase in energy or resource prices. Such an increase leads to further innovations and cumulative effects. If designed together with other tax reductions, the overall effects on international competitiveness do not seem to be insupportable. There is both increasing theoretical and empirical evidence from economics (Oates 2001) that fiscal and regulatory competition resulting from unilateral action contributes to increasing economic efficiency and will not have dramatic effects. Ueta (1997) as well as Nakata and Lamont (2001) arrive at similar conclusions for the impact of carbon or energy taxes on Japan. OECD (2002: 3) thus recommends strengthening and extending the use of economic incentives for Japan in their recent environmental performance review.

But there is certainly no one-fits-all instrument that tackles all the regulatory needs as identified above. Moreover, regulatory policies will differ due to specific national innovation systems (Nelson 1993, Hill 1995) and market conditions. Markets for energy and material flows, for instance, differ significantly with regard to the natural monopoly situation in the electricity sector and the inherent decentralisation regarding materials. Differing conditions lead to case-by-case, market and country-specific analysis that prepares the ground for the diffusion of policies among jurisdictions. As the great French philosopher Montesquieu already noted, “Laws should be so appropriate to the people for whom they are made that it is very unlikely that the laws of one nation can suit another”. Our point here is that eco-efficiency requires some political support, but those specific features will differ from country to country.

3. Institutional Capabilities: Methodology

Following North (1990, 1998) one can argue that the institutional structure of a society shapes the direction and the speed of innovation. More precisely, institutions exclude some options via law, whereas other options are associated with different transaction costs resulting from different kind of institutions. Formal institutions include legal rules for markets and businesses, the social infrastructure for science and education, and legally binding standards. Informal institutions include the norms and value systems of a society that are also vital for demand creation and business culture.

Markets are embedded in a set of institutions, allowing them to allocate resources in a most efficient manner. The question for policy analysis is no longer "do institutions matter" but "which institutions matter and how does one acquire them". According to Rodrik (2000), there are five basic types of market supporting institutions: property rights, regulatory institutions, macroeconomic stabilisation, social insurance, and conflict management. A governance structure is needed to ensure that markets can work properly within its institutional frame. A market economy relies on a wide array of both market-based and political institutions that perform regulatory, stabilising, and legitimising functions. Once these institutions are accepted as necessary element of economies, the traditional dichotomy between market and state or between laissez-faire and intervention loses more and more importance. Both serve complementary functions that keep the system running. A well-performing market economy is a mixed composition of state and markets.

A major implication of the insight is that each institutional framework is unique. There is no "optimal" institutional framework, which can be applied in each country at each stage of economic development. Rather, there is a huge *institutional diversity*, resulting from different formal and informal mappings that are reflected in quite different modes of doing business and economic policy. The European way differs from the US way; both differ from the Japanese way. Within Europe, there are differences between the Scandinavian states, the UK, Germany, and the Mediterranean states.

Our point about institutional diversity leads us to query the diffusion of policy. The following two simplifications illustrate diverging views on this item. Is it possible to transfer an institution from one country to another like any good on world markets? This simplification would be compared to importing a technological blueprint from any pioneer. Interestingly enough, research about

technological change has revealed that such a blueprint image does not seem to work in real economic life (Rosenberg 1994, Freeman 1998). Under the assumption of institutions being much closer to humans than technologies, the blueprint image of diffusion makes almost no sense. There is no manual entitled "how to acquire efficient institutions". In comparison to that view, one might underline the importance of local culture and tacit knowledge. In such an analytical framework, looking at other countries and drawing upon their experience would become useless because of their specificities. Institutions need to evolve locally, relying on specific experience and careful experiments.

It is obvious that both views exaggerate and do not capture real processes of institutional change in some countries, which are motivated by success stories in others. Our first conclusion for policy analysis refers back to institutional diversity: it has to be accepted as a matter of fact. Furthermore, institutional change has to be understood as an incremental process with gradual adaptation processes, comparing outside lessons with internal capabilities. Any outcome of these change processes remains an individual outcome that generates new institutional features. In other words, processes of imitation and experimentation permanently renew institutional diversity. According to Metcalfe (2001: 579) "it is the combination of institutions for selection and development that gives to capitalism its undoubted potential to change itself from within (…)". Langlois and Robertson (1995) on business institutions, Dixit (2000), March (1999), North (1990, 1998), and Rodrik (2000) formulate similar views.

Comparing Japanese regulatory institutions to these findings, Hill (1995: 121 ff.) points to the uniqueness of informal institutions that have enabled MITI's success story of industrial policy. MITI's regulation of the Japanese economy relied upon consensus building rather than on formal rules with sanctions. The famous *administrative guidance (gyosei shido)* took the form of informal associations (with the soft sanction of being excluded) and committees between bureaucrats, researchers, and business leaders. This system can hardly work in other institutional contexts, because of its strong roots in the so-called Tokugawa value system[2] that anchored attributes of group identification, collective responsibility, loyalty and filial piety, reciprocal obligations, harmony, honesty, and individual performance. Based upon these informal institutions, the Japanese market economy with its features of administrative guidance, cross-shareholdings, and self-organisation of production teams could evolve.

An economic perspective on these institutional features refers to transaction costs. In Japan, the transaction costs of achieving cooperation can be considered lower than in other countries. Firms are able to function with more decentralised management systems since the need for hierarchy and control is reduced. Long-term relationships and the lifetime employment system facilitate investments in

[2] The Tokugawa shogunate ruled Japan from 1603 until the Meiji restoration in 1868.

specialisation. Referring to transaction costs means that these features can indeed be imitated by other countries, but at higher costs and with different outcomes. Costs of policy diffusion are mainly transaction costs of changing institutions. Once single institutions fit into an existing framework these costs can be assumed to be low. But any import of bulky institutions is in danger of running into doggedness and low absorptive capacities of existing institutions and is, thus, bound to raise transaction costs up to a significant level. Economic actors are well experienced to articulate concerns, to by-pass unattractive institutions and to escape from those commitments that are regarded disadvantageous. Dixit (2000) elaborates on such a transaction cost approach of economic policy making.

The notion of transaction costs ought to be dynamited in order to include knowledge generation (Wegner 1996, Metcalfe 2001). For the diffusion of policy innovations this can be regarded a key as the national capacities for action largely depend upon the ability to transform knowledge generated elsewhere into a useful proposal for action. Uncertainties and incomplete information can surely be assumed to exist in policy making when considering an adaptation of foreign institutions. What factors enhance the absorptive capacities of domestic policies? Rodrik (2000: 14) stresses participation in the sense of articulation and filtering different views. His main thesis is that *participation* would deliver high-quality growth because it produces stability, provides handling of exogenous shocks, and leads to fair distributional outcomes. Participation reminds us that institutions evolve over time driven by individual action and problem-solving efforts. As a second factor, one might refer to *experimentation* as stressed by Leonard-Barton (1995) on firms, North (1998),[3] and March (1999). Experimentation means that action is taken despite remaining uncertainties. It furthermore assumes parallel efforts to deal with certain problems and that these experiments will be evaluated carefully in order to weigh up costs and benefits. Both factors, participation and experimentation in institutional design, lead to an on-and-off connection between markets and states (Hirschman 1994) insofar as both sides undertake action for improved economic performance and learn from one another. It should also be mentioned that experimentation might include some forms of institutional competition,[4] but only as a means for discovery and selection and not as an end in itself.

It is now possible to compare the analytical framework outlined here with the capacity approach for environmental policy as introduced by Jänicke (1998) and Kern et al. (2001). Jänicke describes a comprehensive model of policy explanation that departs from isolated instruments (“instrument of the year”). By including structural framework conditions such as institutional and informational factors plus the situative context by which short-term variables are captured, this

[3] The terminology of North is slightly different. He refers to competition as well as to the interplay between organisations and institutions.

[4] I don’t enter the realm of institutional competition here; for a balanced overview see v.d. Berg (2000) and Trachtman (2000).

approach enables research to analyse existing policies. Actors and strategies are considered endogenous factors for policies, whereas the structure of environmental problems predetermines from outside the scope of any policy. Capacity, therefore, "defines the necessary structural conditions for successful environmental policy as well as the upper limit beyond which policy failure sets in even in case of skilful, highly motivated and situatively well-placed proponents" (Jänicke 1998: 9).

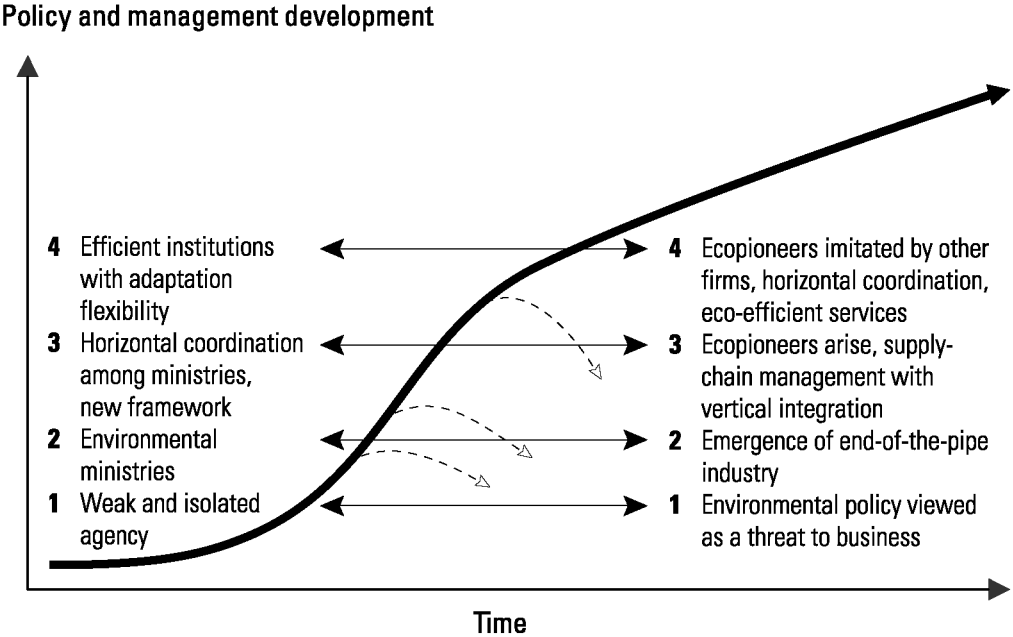
Such an approach evidently also strongly relies on comparative institutional analysis. Like our framework, it leads to case-by-case policy analysis and a permanent search for institutional improvements given that policies usually start with second-best options. Two drawbacks, however, seem to be important that might better be captured with the previously described analytical framework. One drawback refers to businesses and economies. The capacity approach views business, economies and technologies as exogenous variables, leaving it up to future development to determine what specific action is taken. It compares regulation while largely disregarding businesses and market processes. This is not to say that businesses and market processes necessarily will remain outside, but at this stage the capacity model does not seem to properly reflect both. The analytical framework outlined above, in comparison, is based upon economic findings on market processes and institutional change. It allows for the inclusion of business reaction to environmental policy as well as for business action aiming at environmental innovation. The latter indeed is essential for eco-efficiency policies.

A second drawback may be seen in the strong emphasis of political planning elements, which are not fully consistent with basic assumptions of uncertainties, information deficits and open market processes. While focussing on the structure and scope of existing knowledge, there is scarcely a tool available that would allow research to analyse the generation and diffusion of knowledge. Here, our analytical framework emphasises diversity, participation, and experimentation, which are strongly bound to recent theories of institutional change. Both approaches would thus come to slightly different conclusions about environmental policies. Whereas Jänicke views capacity building largely within federal administrations and via integrated environmental planning, our analytical framework emphasises subsidiary principles of decentralisation, adaptation flexibility, and the wellsprings of technological change. Both approaches are indeed not in contradiction, but complement one another and may have different strengths for different purposes. Again, our framework seems superior for an analysis of eco-efficiency policies. The figure below illustrates different stages of environmental policy and management development, taking into account that non-linear events and prevailing resistance may lead to some back-steps.

Summarising some conclusions for policy analysis, the following propositions become evident:

- Institutions and institutional systems are a key to understanding and improving regulatory policies,
- Institutional diversity should be taken as a matter of fact, despite some views about "optimal institutions",
- Any institutional design should rely on participation and experimentation, taking into account that institutional change is overwhelmingly incremental,
- An analytical framework for governance of eco-efficiency should entail an endogenous business element,
- It too should be able to explain generation and diffusion of knowledge rather than analysing existing stocks,
- Research organisation for comparative analysis should include experts from both sides.

Stages in Environmental Policy and Management Development



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4. Japanese Approaches to Eco-Efficiency

Japan has a good reputation for having successfully tackled energy use and pollution in the 70s and 80s. The 90s saw a break in environmental policy mainly due to the economic crisis (Imura 1997, Ren 2000, Wallace 1995, Watanabe 1999, Weidner 1996). In the last few years, however, Japan has undertaken major steps that revitalise environmental policy towards eco-efficiency. A focus is on waste and recycling issues, which have been triggered by a shortage of landfill capacities and the necessity to import natural resources. The Japanese label for these activities is "3R" – reduction, reuse, recycle. The aim is a recycling-oriented society (*junkankata keizai*). This focus almost naturally coincides with eco-efficiency strategies as characterised above. The Japanese parliament passed the following laws in May 2000:

1. Basic Law for the Promotion of the Recycling-Oriented Society,
2. Waste Management Law,
3. Law for Promotion of Effective Utilisation of Resources,
4. Construction Materials Recycling Law,
5. Food Recycling Law
6. Green Purchasing Law.

Additionally, the Containers and Packaging Recycling Law has been amended, and the Home Appliances Recycling Law could enter into force.

In January 2001, the existing Environmental Agency was transformed into a Ministry for the Environment (Schmidt 2001, BFAI 2001: 10, 21). The new Ministry now holds responsibility for basic questions of environmental policy, basic environmental plans, waste, water and air pollution, nature protection and biological diversity, liability for damages, and international environmental cooperation (e.g. climate change). Responsibilities, thus, have been widened compared to the former agency. On the other hand, the Ministry for the Economy (METI, former MITI) still retains authority for chemicals and hazardous substances, recycling, measures to combat global warming, and environmental impact assessments. The latter is also within the responsibility of the Ministry for Infrastructure, which is also in charge of construction. Given the relatively poor budget and staff situation, Schmidt (2001: 256) and other observers arrive at mixed expectations about the likely impact of the new Ministry. The sheer fact of the Ministry's existence together with the aligned competences will allow for an increasing impact on other policies, whereas other ministries (METI and Infrastructure) remain powerful and are likely to override the newcomer in the

next years when conflicts arise. For an analysis of Japanese policies, these well-established ministries have also to be taken into account. Coordination among ministries, as underlined by Imura (1997: 82) and Ren (2000: 81), remains an important issue.

With regard to the various new environmental laws, the Basic Law for the Promotion of the Recycling-Oriented Society establishes for the first time a hierarchy beginning with resource reduction, on to reuse, recycling, thermal recycling, and disposal. The government is committed to launching framework programmes for action to be undertaken by industry and private households every five years. Also, the extended producer responsibility is a new element of that law. More specific regulations are laid down in the Law for Promotion of Effective Utilisation of Resources. It encourages administrative guidance for designated products in industries that promote the use of recycled resources, improve the durability of products and their dismantling structure. The sectors of steel, paper, and cars as well as products like TVs, PCs, refrigerators, air conditioners, washing machines, copy machines, furniture, etc., have been the subject of such regulatory efforts, mainly by METI. Some products have to meet recycling quotas, but the majority of these measures still lack clear targets. This corresponds to a lack of environmental targets in other integrated sectoral plans (Foljanty-Jost 2001: 100, OECD 2002: 8). Also the renewed "Energy Saving Law" from 1999, which establishes a "top runner system" for electric appliances and introduces incentives for an energy efficiency increase in passenger cars by 20% by the year 2010, should be mentioned. Possible sanctions for all these laws will range from a letter of discontent, a public statement, a ministerial ordinance, and monetary payments. These measures will, after all, increase the playing field of administration.

Environmental management has been pointed out as an active element of eco-efficiency. Japan has a good record in environmental management, which has been institutionalised in a system of pollution control managers and energy saving managers at corporate level. According to Ren (2000: 86, 88), more than 65% of Japanese companies have a pollution control department. The majority perceives environmental affairs as necessary for profit generation and competitiveness, though concerns about costs remain relevant (Baum et al. 2000: 445). Approximately 3,500 firms act as an "energy control factory" that develops strategies for energy efficiency. Some 30,000 companies committed themselves to CO_2 reduction, e.g. Toshiba announced a reduction target of 20% by the year 2010 compared to 1990 level (BFAI 2001: 20, 23).[5] "Zero emissions" is a word often heard in talks with Japanese companies. The corresponding number of ISO 14.000 certifications in Japanese companies is higher than in Germany or the UK. The environmental market including recycling and energy efficiency is expected to

[5] See also the Japanese-German dialogue on climate change policies by Ott and Takeuchi (2000).

grow by some 50% from 2000 – 2010 (BFAI 2001: 31). Interestingly, however, many companies are no yet sure *why* they should expand their efforts and *how* innovation can be spurred via managerial tools. They actively ask for a management perspective beyond ISO, i.e. towards eco-efficiency. Single pioneers plus consultant efforts may contribute to dissemination of such managerial tools. The Japanese business institutions of the joint-stock company facilitate supply-chain management and vertical integration among firms. Horizontal coordination among firms of different markets will require more laborious efforts. The existing eco-industrial park in Kitakyushu provides a first example of how such a better cooperation might be achieved (Bleischwitz/ Schubert 2001).

Some actors advocate an economic vision of the Japanese economy that comes close to the Factor Four idea as proposed by Weizsaecker at al. (1997). Clean Japan Center, a semi-governmental organisation under METI, promotes the vision of the recycling-oriented society, following a report of the Industrial Structure Council from 1999 (Clean Japan Center 2000). In addition, they recommend further measures in certain areas. In April 2002, a new METI-committee on "Factor Eight" for improving resource productivity started its work under the chairmanship of Ryoichi Yamamoto who has already published reports on these items (Yamamoto 2001). In a similar vein, Hiroshi Komiyama from Tokyo University and chairman of METI's material flows committee, enlightened the participants of the Fourth Forum of the Collaboration Projects[6] in February 2002 with his "vision 2050". He pointed out thresholds of thermo physics that are still remote to technical change and, thus, allow for further improvements. According to Komiyama, the potential for "green productivity" with increases up to a factor ten can be considered enormous. Whether these voices will have an impact on Japanese policy remains to be seen. In our opinion, visions have been formulated that bear the potential of becoming implemented by both policies and businesses. Similar to our view, Watanabe (1999: 729) and Yoshida (2002) state a high acceptance of eco-efficiency and Factor Four in Japanese industry.

Comparing policies in Europe with those of Japan, it seems that basic principles of legislation and ensuing approaches have converged to a significant extent. Also the visions touched on in the previous paragraph are relatively close to each other. If it comes to specific regulations, however, differences appear that are driven by domestic institutions. Administrative guidance is a particular feature of Japanese regulation. Regarding eco-efficiency, this approach may foster flexible solutions

[6] A study programme by the Japanese Economic and Social Research Institute from 2000–2002, to which WI contributed a study. In other studies, Kazuhiro Ueta from Kyoto University as well as researchers from Mitsubishi and Nomura Research Institute introduced different regional waste management schemes. Koichiro Agata and colleagues from Waseda University highlighted some new policy options. They focussed on local action in the area of the provision of public goods, specifically featuring local currencies called LEMS. These currencies are designed in a way that allows combining the respective advantages of markets and local institutions, involving of citizens, unemployed people as well as small and medium-sized enterprises.

serving the needs of different businesses in different phases of market development. On the other hand, some of these efforts might expose Japan to WTO restrictions when foreign companies feel competitive disadvantages caused by intransparent regulation. One might also ask the question how new forms of administrative guidance encourage proactive measures by companies. This is an open question – Ren (2000: 92) offers a sceptical view on innovativeness of regulation in Japan, Watanabe (1999: 743) calls for a new initiative with a comprehensive approach by METI.

Participation is another case in point. Though the Basic Environment Law introduced in 1993 integrated public participation into policy making,[7] overall public participation seems relatively low. This corresponds to less impact by the parliament, local authorities and green NGOs on environmental policies compared to many European countries (BFAI 2001: 22). In line with the above analysis on regulation needs and institutional change via participation, further improvements in public access and participation as well as a promotion of environmental NGOs appear on the agenda for institutional reforms. OECD (2002: 9, 10) also suggests similar measures.

Assuming further regulation of eco-efficiency in Japan, active experimentation might become stronger than in previous years. Experiments rely on pioneering activities by some companies as well as on the activities of lower policy arenas. Contemporary efforts by some regional governors and local communities will strive forward and, thus, increase the costs for consensus-seeking activities with those lagging behind. Decentralisation of Japanese policy as foreseen by the government might favour those pioneering activities, which go beyond agreed standards. This may partly depart from traditions of harmonisation and consensus, but lower the transaction costs of identifying superior solutions in case of uncertainties and hence lower the compliance costs. It may lead to more federalist elements in Japan.

[7] Also the Law on Disclosure of Information (entry into force 2001) should be mentioned.

5. Conclusions

Despite the overall economic crisis, Japanese policy has undertaken some major steps towards the governance of eco-efficiency in the last two years. The waste and resource-saving laws as well as the Basic Environment Law and information-related acts can now be considered among the top from OECD countries. The Japanese Government has thus ended the environmental stalemate of the nineties. With forward-looking visions from single actors and by pioneering industry efforts, one may expect further progress in the next years.

One critical element for further progress relates to the relationship between the new Environment Ministry (MoE) and METI, and other relevant ministries. There is no doubt that METI has outstanding expertise in eco-efficiency. Whether this coincides with MoE and industries' efforts remains, however, to be seen. If a struggle for competence and rivalry dominates, the outcome won't be productive. If, on the other hand, METI contributes to an improved coordination among ministries and balances different interests via innovation-oriented regulation, the outcome will be positive. The Cabinet Office, in charge of policy coordination, will certainly also play a role. Following that line, voluntary agreements as one pillar of administrative guidance should become more transparent and reliable, perhaps with more involvement from the public and NGOs. Also a stronger role of targets, economic incentives such as eco-taxes, and a revision of subsidies seem reasonable. Interestingly enough, these conclusions refer to regulatory tools as such and not to a general transfer of competences to MoE.

The role of industry will remain vital for the success of eco-efficiency. Despite the overwhelming acceptance of ISO and environmental management in general, both managerial tools for innovation and a stronger role of SMEs appear to be candidates for improvements. The latter in particular is essential when one bears in mind the important functions of vertical and horizontal coordination among firms for eco-efficiency. Supply-chain management can be expected to include eco-efficiency criteria relatively smoothly, but horizontal coordination that relies on communication and cross-sectoral exchange of knowledge seems pivotal and deserve further efforts. Along this possible development, industry and society might become more important than administrations.

After all, the Japanese economy will continue to serve as a laboratory for other Asian emerging economies. By absorbing European and other experience and transforming it into country-specific institutions, it might well play that role for eco-efficiency too. Europeans in turn might draw upon that knowledge for their

domestic efforts. If the US remains to be reluctant to enforce environmental policies, the European-Japanese cooperation will gain importance compared to previous years. Governance of eco-efficiency, thus, will continue to differ between countries, and these differences will fuel improvements in each country. As the analytical framework presented in our article underlines, these processes of improving institutions by mutual learning are crucial for better policies.

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